AP Statistics Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Classwork Ch. 16 Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block:\_\_

1. You are at the fair and decide to try a game of ring toss. You know that you have a probability at any time of throwing the ring on the bottle of 15%. You get three rings to toss for $5. You stop playing once you win. If you make the first ring you win $20, if you make the second one you get $10, and if you make the last one you win $5. If you miss all three rings, you win nothing.
2. Create the probability model for your winnings (GAIN). (create a tree diagram to help you!) (5 pts)
3. What is the probability that you will gain at least some money? (2)
4. What is your expected gain? (2)
5. What is the standard deviation? (2)
6. What is the mean and standard deviation of your gain if you played the game 5 times? (4)
7. A fast food restaurant just leased a new freezer and food fryer for three years. For the ***freezers***, the restaurant’s research suggested that during a given year 11% needed to be serviced once, 5% twice, 4% three times, and none required **more** than three repairs.
8. Create the probability distribution for the number of repairs on the freezer. (3)
9. What is the probability that the freezer will need ***at least*** 1 repair within the next year? (2)
10. What is the expected number of repairs this kind of freezer is expected to need each year? (2)
11. What is the standard deviation of the number of repairs each year? (2)
12. Suppose the restaurant needs three of these freezers. Assuming that each freezer is independent of the others, what would be the mean and standard deviation for the number of repairs needed for all three in the one year? (4)
13. The service contract for the freezer offers unlimited repairs for a fee of $125 a year plus a $35 service charge for each repair needed. What are the **mean** and **standard deviation** of the restaurant’s annual ***expense*** for the service contract for a single freezer? (4)
14. The yearly service contract for the food ***fryer*** estimates a mean annual cost of $140 with a standard deviation of $40. What is the expected value and standard deviation of the ***total* *cost*** for the service contract for the ***freezer and the fryer***? (4)
15. Which service contract should the restaurant ***expect*** to cost more each year? How much more? With what standard deviation? (5)
16. The weight of checked luggage from airline customers has a mean of 58 pounds with a standard deviation of 9.7 pounds. The weight of a carry-on bag has a mean weight of 26 pounds with a standard deviation of 7.3 pounds. Suppose that both follow a normal distribution.
    1. Find the mean and standard deviation for the weight ***total*** of both the checked and carry-on luggage of a customer. (4)
    2. What is the probability that the total weight of the bags would be more than 100 pounds? (3)
    3. Suppose a flight has 120 passengers. What is the probability that the total weight for the 120 passengers’ entire luggage (carry-on +checked bags) exceeds 10,400 pounds? (6)